



SAN BERNARDINO MICROWAVE SOCIETY, Incorporated

FOUNDED IN 1968

A NONPROFIT AMATEUR TECHNICAL ORGANIZATION DEDICATED
TO THE ADVANCEMENT OF COMMUNICATIONS ABOVE 1800 MC.

W6IFE Newsletter

President **Dick Bremer WB6DNX** 1664 Holley St Brea CA 92621, 714-529-2800, rabremer@sbcglobal.net

VP **Chris Shoaff N9RIN** 2911 Calle Heraldo San Clemente CA 92673, 949-388-3121, cshoaff@netzero.net

Recording Sec **Mel Swanberg, WA6JBD** 231 E Alessandro Blvd Riverside, CA 92508, 909-369-6515, swanberg@pe.net

Corresponding Sec **Kurt Geitner, K6RRA** 1077 E Pacific Coast Hwy #142 Seal Beach, CA 90740, 310-718-4910, k6rra@gte.net

Treasurer **Dick Kolbly, K6HIJ** 26335 Community Barstow, CA 92311, 760-253-2477, rkolbly@compuserve.com

Editor **Bill Burns, WA6QYR** 247 Rebel Rd Ridgecrest, CA 93555, 760-375-8566, bburns@ridgecrest.ca.us

Webmaster Chip Angle, N6CA 25309 Andreo Lomita, CA 90717, 310-539-5395, chip@anglelinear.com

ARRL Interface Frank Kelly, WB6CWN 1111 Rancho Conejo Blvd. #501 Newbury Park, CA 91320, 805-499-8047, fk@event1.com

W6IFE License Trustee Ed Munn, W6OYJ 6255 Radcliffe Dr. San Diego, CA 92122, 858-453-4563, edmunn@compuserve.com

At the 4 **March 2004** meeting of the SBMS, Dave is going to do a talk about Surface Mount Technology (SMT) soldering. We will also have some presentations to make to members for technical advancement and becoming senior members, so you will want to be there 'cause you might get one. The SBMS meets at the American Legion Hall 1024 Main Street (south of the 91 freeway) in Corona, CA at 1900 hours local time on the first Thursday of each month. Check out the SBMS web site at <http://www.ham-radio.com/sbms/>.

SBMS meeting parking- We have become a great number of members at meetings. We park next to the church in the adjacent lot or on the street and or in the lot across the street. Across the street the sign on the building shows: 1025 Main Street. MAIN STREET BISTRO. The sign on the parking lot says: CLIN CHIROPRACTIC CARE Dick, WB6DNX

If you have changed QTH or other mail address please let Bill, WA6QYR know so the newsletter will continue to reach your home.

The annual SBMS banquet will be held on 6 March at the Steer Grill for 4:30 on March

6th. The Grill is at 2395 Hamner Ave in Norco. The phone is 909 734 5441. Be sure to bring a white elephant gift for the exchange. We hope to have door prizes. Doors: white or brown or maybe just hardware to hang them.
Doug

Last Meeting. Dave, WA6CGR talked about his new 10 GHz rig which uses a DB6NT converter locked to a rubidium standard, a gold plated 3 ft dish, a JME 5112 PLL board, an HP dc-dc converter and a 10w amp. The Microwave Update 2005, which the SBMS is responsible for, will be held in Cerritos. Coordinators are Dave, WA6CGR, Pat, N6RMJ, and Dennis WA6NIA. Welcome to new member Steven Miller W6QIW of Santa Barbara. Welcome to visitors: Matt, KE6ALM of Lake Forest, and to Bill, K0AWU of Grand Rapids MN. Chuck, WA6EXV had certificates for the winners of the 2 GH and Up contest. It was proposed that there be a microwave activity weekend on the third weekend of the month from about 10 am to later. Next meeting we are to bring something from your original amateur station. 24 people in attendance.

Activity- Glenn, KE6HPZ was a rover in the January VHF contest and worked 11 grids. Larry, K6HLH worked Larry, KG6EG on 10 GHz over the LA mountains and was on the VHF contest with 1, 2, 3 and 10 GHz; Howard, WA6YGB is building a 1296 cavity (N6CA design) with 7289 tubes; Dick, K6HIJ built some WR-42 flanges, a WR-62 to 42 transition and a new WR42 waveguide switch; Pat, N6RMJ has a new 10 GHz rig with 0.6 NF and 1 or 25 W output and worked the VHF contest; Dave, WA6CGR has a new 10 GHz rig and 5760 rig; Wayne, KH6WZ had a loaner 3 GHz during the contest and has new ebay hardware; Larry, KG6EG worked the contest on 10 GHz; Paul N6DN roved with 6mtr through 10 GHz rigs; Mike, W6YLZ worked the contest on 144 and 432 MHz and 10 GHz and has a recalled DB6NT converter; Jerry, N7EME has more test equipment working and is building his 10 GHz rig; Doug, K6JEY rebuilt his 10 GHz rig; Dennis fixed up his lab; Scott, K0SMC is building his 10 GHz rig; Gary, W6KVC is working on 24 GHz ATV; Bill, K0AWU had a loaner 10 GHz rig in north Minneapolis and worked over 450 miles via rain scatter, and now had two 10 GHz rigs; Steve, AD6HT was a rover in the contest and has a 5760 Qualcomm board from Kerry; Bill, WA6QYR worked on his second 2 GHz rig and a sequencer; Chuck, WA6EXV built a DSP-10 for WB6CWN and is pulling his 10 ft dish down for gear reworking Gordon, WA6FMX talked to RACES in his area about use of microwave; Mel, WA6JBD remodled his shop.

Scheduling:

1 April TBD

1-2 May SBMS 2 GHz and Up contest.

12-14 June ARRL June VHF QSO Party

26-27 June ARRL Field Day

7-8 August ARRL UHF Contest

21-22 August ARRL 10 GHz and Up Contest

11-12 September ARRL September VHF QSO Party

18-19 September ARRL 10 GHz and Up Contest

14-16 October 2004 Microwave Update in Texas

"Wants and Gots for sale"

Want 10 GHz High power amp (cheap) Chris Shoaff N9RIN 949-3880-3121

Want more suggestions or source of lossy material-plastics, etc. for mode suppression in waveguide switch Dick K6HIJ 760-253-2477 dick@eventhorizons.com

Want- 24 GHz waveguide relay, Solid State 10 watt 10 GHz amp or Blue Siemens for 10 GHz W6YLZ 818-349-8525

Want- a WR-90 "quick release" wave guide adapter. Larry KG6EG kg6eg@socal.rr.com

For Free- 10 ft 10ft 6 inch, and 6 ft dishes. Up pick up Chuck WA6EXV 760-377-4972

Off the email-

Hi All, Here is the loop I am using for the reference receiver. It locks the brick internal oscillator to exactly 108.000000 MHz. The functional blocks are described as follows:

BRICK: The brick uses its internal 108 MHz crystal oscillator and oven. It is modified to remove the oscillator and oven from the -20v power to the balance of the brick circuitry. There is a black wire, which attaches to the board just below the variable inductor (Cal micro bricks), The point is marked J1 on the board. Remove the black wire and route J1 to the BNC connector, which is used for modulation input. (Disconnect the modulator from the BNC) The power requirement at J1 is about 300ma cold and about 100ma after the oven warms up. My brick has a modulation sensitivity of about 42Hz/volt and is linear from 17 to 20.5 volts.

COUNTER: The divide by 108 counter uses a 74F112 as a divide by 3/4 prescaler. The remainder of the counter is a 74F163 which operates in a /15 or /16 mode. The prescaler is controlled by a 74F109 flip-flop. The output is a nearly symmetrical square wave at 1 MHz. It is filtered with a pi section filter to make a fairly good sine wave. The signal level is about +7 dbm. (The square wave needs to be reduced to a sine wave, or the mixer has a very rough DC output which is hard to filter.)

PHASE DETECTOR: The phase detector is a Mini Ckts SRA1-H. According to the Mini Ckts literature, a high level mixer makes a better phase detector. The output is sinusoidal when out of lock. The waveform is a beat frequency between the counter output and the reference signal. As it nears lock, it becomes a smooth DC signal. Mini Ckts recommends a 470 ohm load and a 1k/ .01 filter at the IF output.

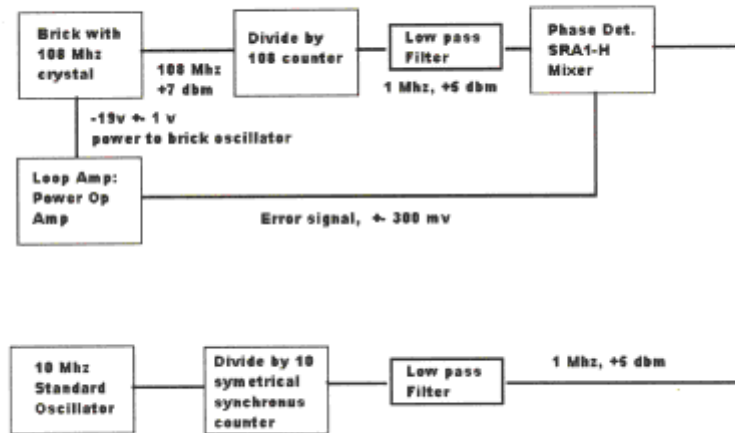
LOOP AMPLIFIER: The loop amp is a 741-op amp with a 2N2905 emitter follower booster inside the loop. It has to deliver 300ma to the brick when it is cold and about 100ma when it is warm and in lock. The impedance levels are set at 10K ohms. It has minimal filtering, just enough to keep it from oscillating. It serves as a summing amp for the mixer output and a DC offset voltage to set the operating point of the brick oscillator. The set point is about -19 volts. (The brick can be fine-tuned using the variable inductor in the Cal Micro brick.)

REFERENCE OSCILLATOR: A standard 10mhz crystal oscillator is used as the reference. Mine uses a crystal osc. by Piezo which has a stability of about 3×10^{-9} . It happens to have a TTL level square wave output. The counter is a synchronous /10 to produce a symmetrical 1mhz square wave. The signal uses a 74ALS244 buffer to drive a low pass filter. The output is a 1Mhz sine wave at about the +5dbm level. [Any good 1 MHz source will work, I just happened to have this one]

Following is the block diagram. Nothing special here except the use of oscillator voltage to pull the brick frequency instead of the usual varactor on the crystal. This loop is so slow, that it has a minimal effect on the phase noise of the oscillator. No detectable additional sidebands at 47Ghz.

73 Phil, W6HCC

Disciplined Brick (PLL) - W6HCC



Hello Microwavers, In December I sent an email via this reflector about the newly added SBMS web page info on 47 GHz harmonic mixer experiments by N6IZW and the Colorado group including N0UGY, K0RZ and W6HCC. This same announcement was repeated in the SBMS February 2004 Newsletter, page 3. I made an error in the URL given for this page. There is a period between "sbms" and "sd". This should have been a "/". The correct URL is: <http://www.ham-radio.com/sbms/sd/projindexhtm>. Sorry about that. 73s from Ed Munn, W6OYJ w6oyj@amsat.org

Hello Bill, I don't know if this is new news, but I viewed the NTMS web page today, and they show the 2004 Microwave Update will be October 14-16 at the Harvey Hotel DFW Airport, Dallas/Ft Worth TX. The NTMS is the host. No further info mentioned. 73s from Ed, W6OYJ

Planning for the 2005 Microwave Update&emdash;

I was talking to Gordon Huff, WA6FMX after the last meeting, and he commented that the thing he enjoyed about Microwave Update 2002 in Sunnyvale was the "surplus crawl" of the various shops in the area. I would ask that you put a notice in the newsletter that we are making up a list of electronic surplus stores in the Southern California area, and would like input from individuals.

The following information would be appreciated:

1. Address
2. Hours of Operation
3. Telephone (if known)
4. Comments about:

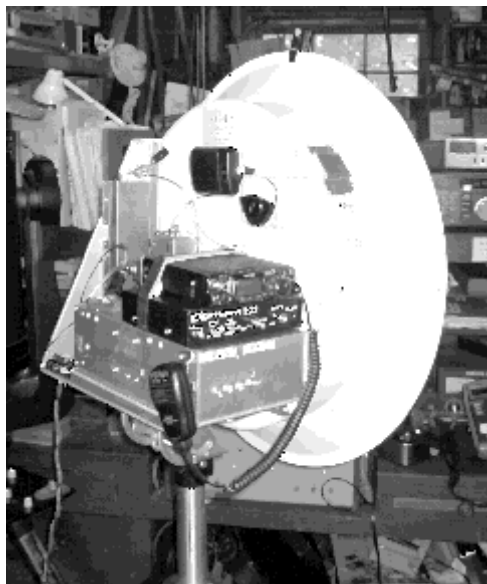
Stock

Prices

Type of items carried

Overall opinions, etc. (Would you send a friend there?)

If we get some information, we can either do one of these for the attendees or at least provide an information sheet. I can add this information to the Event Horizons web site (We are #1 on providing swap meet information!) Dick K6HIJ



Doug, K6JEY has been rebuilding his 10 GHz roving rig. This is the back view with all the hardware mounted on a plate that also supports the dish. He is playing with digital signal processing too. Photo supplied by K6JEY.



Following after the "flame thrower of WA6CGR" Doug added the biker blinking light on top to indicate radiation. He also had his call and 10 GHz written on the dish, which kind of washed out when lightening the photo for printing.



Some of us have more fun testing our rigs than we ought to. K6JEY does some interesting things at times with his rig.



Dave, WA6CGR "torch" rig. Black and white doesn't do justice to this early evening picture with the red neon light coming from inside the rig. Just like something out of sci-fi movie, Dave's rig glows in the dark.

The San Bernardino Microwave Society is a technical amateur radio club affiliated with the ARRL having a membership of over 90 amateurs from Hawaii and Alaska to the east coast and beyond. Dues are \$15 per year, which includes a badge and monthly newsletter. Your mail label indicates your call followed by when your dues are due. Dues can be sent to the treasurer as listed under the banner on the front page. If you have material you would like in the newsletter please send it to Bill WA6QYR at 247 Rebel Road Ridgecrest, CA 93555, bburns@ridgecrest.ca.us, or phone 760-375-8566. The newsletter is generated about the 15th of the month and put into the mail at least the week prior to the meeting. This is your newsletter. SBMS Newsletter material can be copied as long as SBMS is identified as source.

San Bernardino Microwave Society newsletter

247 Rebel Road

Ridgecrest, CA

93555

USA

